

REMARKS:

New claims 21 and 22 are added. Pursuant to this amendment, claims 1-22 are pending in the present application. Reexamination and reconsideration of the application, as amended, are respectfully requested.

Claims 1-4 are rejected as being anticipated by Kato et al. Claims 5-8, 10-13, 15-16, and 19 are rejected as obvious over Kato et al. in view of Koyama et al. In addition, claims 9, 14, 17, 18 and 20 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. All rejections and/or objections are respectfully traversed. As discussed below, all pending claims are believed to be in condition for allowance.

The present invention is generally directed to a display device having a plurality of semiconductor elements so arranged in the display device to alleviate deterioration of display characteristics associated with a laser annealing process upon the display device. Specifically, claim 1 of the present invention requires that "a channel width of a channel region formed in a semiconductor layer to which laser annealing is applied is larger than a channel length thereof, and a channel width direction is formed in a direction different from a side direction of said substrate".

In contrast, Kato describes a method of making a TFT display device having a plurality of row and column pixel-drive-TFTs each having a polycrystalline channel and arranged in a line-like form respectively corresponding to pixel electrodes arranged in a matrix form. However, Kato does not teach or suggest that the channel width direction of the driver transistors differs from the side directions of the substrate of the display device or from the longitudinal and/or short axial directions of the laser beam used to anneal the display device. According to Kato, the TFT driver transistors of the row driver circuits 6 are disposed on the same line as the transistors for picture display and the TFT driver transistors of the column driver circuits 7 are disposed on the same column as the transistors for picture display, see Fig. 4 and column 8, lines 40-44. Moreover, the scanning for laser beam annealing is conducted in the direction of row electrode line of the Kato device and

is parallel to the upper and lower sides of the substrate, column 8, lines 29-31. Consequently, it is clear that the driver circuit transistors of Kato are arranged in an exactly same way as those of a conventional TFT display device. As such, the Kato device will certainly experience the same difficulties of a conventional TFT LCD device when using a laser beam to anneal the TFTs thereof. Claim 1 of the present invention requires that a channel width direction of some or all of the semiconductor elements is formed in a direction different from a side direction of the substrate to alleviate the above-mentioned problems. Therefore, claim 1 is not anticipated by Kato, and is believed to be in condition for allowance.

Claim 2 is a dependent claim of claim 1. Thus, on the basis of its dependency, claim 2 similarly distinguishes over Kato, and is believed to be in condition for allowance.

Likewise, claim 3 of the present invention requires that "in some or all of said semiconductor elements ... a channel width direction is formed in a direction different from a major-axis direction and/or a minor-axis direction of a laser-beam irradiated region at the time of application of said laser annealing". Such a limitation is not taught or suggested by Kato. Therefore, claim 3 is patentably distinguishable over Kato, and is believed to be in condition for allowance.

Claim 4 is a dependent claim of claim 3. Thus, on the basis of its dependency, claim 4 distinguishes over Kato, and is believed to be in condition for allowance.

With respect to claim 5, that particular claim requires that "in some or all of said plurality of second thin-film transistors ... a channel width direction is formed in a direction different from a side direction of said substrate".

The Koyama patent, on the other hand, describes a matrix type liquid-crystal display unit having a plurality of first thin-film transistors that form the signal-line drive circuit and a plurality of second thin-film transistors that form the scanning-line drive circuit. Koyama patent provides a matrix type display unit that controls the threshold voltage of TFTs by the application of a voltage, thereby reducing a power consumption of a drive circuit or improving the operating frequency of the drive circuit. However, nowhere in Koyama teaches or suggests that a channel

width direction is formed in a direction different from a side direction of said substrate, as recited by claim 5 of the present invention. Thus, since neither Kato nor Koyama teaches or suggests the limitation required by claim 5, claim 5 distinguishes over Kato and Koyama, either taken alone or in combination, and is believed to be in condition for allowance.

Claims 6-9 are dependent claims of claim 5. Therefore, claims 6-8 are similarly distinguishable over Kato and Koyama, and are believed to be in condition for allowance.

With respect to claims 10-14, claim 10 requires that "in some or all of said plurality of second thin-film transistors ... a channel width direction is formed in a direction different from a major-axis direction and/or a minor-axis direction of a laser-beam irradiated region at the time of application of said laser annealing". Neither Kato nor Koyama teaches or suggests the above-mentioned limitation required by claim 10. Therefore, for the similar reasons stated above, claim 10 patentably distinguishes over Kato and Koyama, either taken alone or in combination, and is believed to be in condition for allowance.

Claims 11-14 are dependent claims of claim 10. Therefore, on the basis of their dependency, claims 11-14 similarly distinguish over Kato and Koyama, and are believed to be in condition for allowance.

Claim 15 requires that "a channel width direction of some or all of second thin-film transistors being formed non-parallel with and non-orthogonal to a channel width direction of said first thin-film transistors". As mentioned, the driver TFT transistors in Kato are formed similarly to those of a conventional TFT LCD device wherein the driver TFT transistors are formed parallel with or orthogonal to the TFT display transistors. Moreover, Koyama does not teach or suggest how the TFT transistors of the signal-line drive circuit or the scanning-line drive circuit are arranged with respect to the TFTs of the pixel portions. As a result, claim 15 is patentably distinguishable over Kato and Koyama, either taken alone or in combination, and is believed to be in condition for allowance.

Claims 16-20 are dependent claims of claim 15. Therefore, on the basis of their dependency, claims 16-20 similarly distinguish over Kato and Koyama, and are believed to be in condition for allowance.

The newly added claims 21 and 22 are dependent claims of claim 10. Thus, claims 21 and 22 are not obvious over Kato and Koyama for the similar reasons stated above, and are believed to be in condition for allowance.

The art made of record but not relied upon by the Examiner has been considered. However, it is submitted that the art neither describes nor suggests the presently claimed invention.

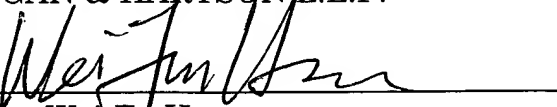
In view of the foregoing, it is respectfully submitted that the application is in condition for allowance. Reexamination and reconsideration of the application, as amended, are requested.

If for any reason the Examiner finds the application other than in condition for allowance, the Examiner is requested to call the undersigned attorney at the Los Angeles, California telephone number (213) 337-6700 to discuss the steps necessary for placing the application in condition for allowance.

If there are any fees due in connection with the filing of this response, please charge the fees to our Deposit Account No. 50-1314.

Respectfully submitted,  
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